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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,638	11/21/2003	Chang Su Kyeong	049128-5126	9127

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EXAMINER

EISEN, ALEXANDER

ART UNIT PAPER NUMBER

2629

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/717,638

Applicant(s)

KYEONG ET AL.

Examiner

Alexander Eisen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 20-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 20-22, 24, 28 and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Koyama et al., (hereinafter Koyama), US 6,597,349 B1.

With respect to claims 1 and 20 Koyama discloses a driving apparatus for a liquid crystal display and associated with it method comprising a first multiplexor array to perform time-division on input pixel data to supply time-divided pixel data having a horizontal period divided into four 1/4 periods; a digital-analog conversion array to convert the time-divided pixel data pixel voltage signals; and a demultiplexor array to drive data lines by performing time-division on the pixel voltage signal by the 1/4 period (FIGS. 2-3, 14; column 4, line 56 – column 7, line 55).

As pertaining to claim 3, the first multiplexor array 209 includes at least N (N being a positive integer) of multiplexors and performs time-division on a plurality of input pixel data to supply the time-divided pixel data, wherein the digital-analog conversion array 208 converts the

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time-divided pixel data into the pixel voltage signals, and wherein the demultiplexor array 210 includes at least N of demultiplexors and supplies the pixel voltage signals into a plurality of data lines.

As pertaining to claim 21, the pixel data supplied to a specific data line are output only during an odd-numbered or an even-numbered  $\frac{1}{4}$  periods of the horizontal period (see FIGS. 2-3).

As pertaining to claim 22, the pixel data is converted into a voltage signal by D/A converters 208.

As pertaining to claim 24 the supply sequence of the time-divided pixel data and pixel voltage signals is alternately changed.

As pertaining to claim 28, Koyama discloses a liquid crystal display, comprising a liquid crystal panel; and a driving apparatus connected to the liquid crystal panel, the driving apparatus including: a first multiplexor array 209 to perform time-division on input pixel data to supply time-divided pixel data having a horizontal period divided into four  $\frac{1}{4}$  periods; a digital-analog conversion array 208 to convert the time-divided pixel data pixel voltage signals; and a demultiplexor array 210 to drive data lines by performing time-division on the pixel voltage signal by the  $\frac{1}{4}$  period.

As pertaining to claim 29, Koyama discloses a driving apparatus for a liquid crystal display, comprising means (multiplexors 209) for performing time-division on input pixel data to supply time-divided pixel data having a horizontal period divided into four  $\frac{1}{4}$  periods; means for converting the time-divided pixel data into pixel voltage signals (D/A converters 208) ; and

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means for performing time-division on the pixel voltage signal to supply the time-divided pixel voltage signal to data lines of the liquid crystal display by the 1/4 period (de-multiplexors 210).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama.

With respect to claim 2 Koyama discloses that the driving apparatus further comprises a shift register array 201 to sequentially generate a sampling signal; a latch array 203 to sequentially latch the pixel data by designated units in response to the sampling signal such that the latched data is simultaneously output to the first multiplexor array 209.

While Koyama does not specifically disclose a buffer array to buffer the pixel voltage signal and to supply the buffered pixel voltage signal to the demultiplexor array, using buffers for impedance or load matching in signal lines is well known in the art and therefore it would have been obvious to one of ordinary skill in the art at the time when the invention was made to use the buffers if required by design constraints without bringing any unexpected result or performing undue experimentation.

As pertaining to claim 23, it is also commonly known to use polarity reversal when driving pixels of liquid crystal displays using various reversal patterns, such as frame inversion, line inversion, etc., including changing polarity to be different from adjacent pixel data (e.g. dot inversion), and hence it would have been obvious to one of ordinary skill in the art at the time

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when the invention was made to modify the display of Koyama with such driving in order to improve display characteristics.

***Allowable Subject Matter***

6. Claims 4-19 and 25-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: none of the references, either singularly or in combination, teach or fairly suggest the limitations of the dependent claims above when considered in the scope of the claims they are dependent upon.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

**Shigehiro, US 6,229,512 B1**, discloses alternating sampling of positive and negative polarities video signals.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Eisen whose telephone number is (571) 272-7687. The examiner can normally be reached on M-F (9:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Alexander Eisen', with a stylized flourish at the end.

Alexander Eisen  
Primary Examiner  
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23 June 2006